



# RF and mmWave Circuit Design

LABORATORIES – INTRODUCTION

dr. Carlos Mendes, Jr.  
prof. dr.-ir. Peter Baltus  
prof. dr. Marion Matters

Department of Electrical Engineering, Integrated Circuits Group

coursera

TU/e

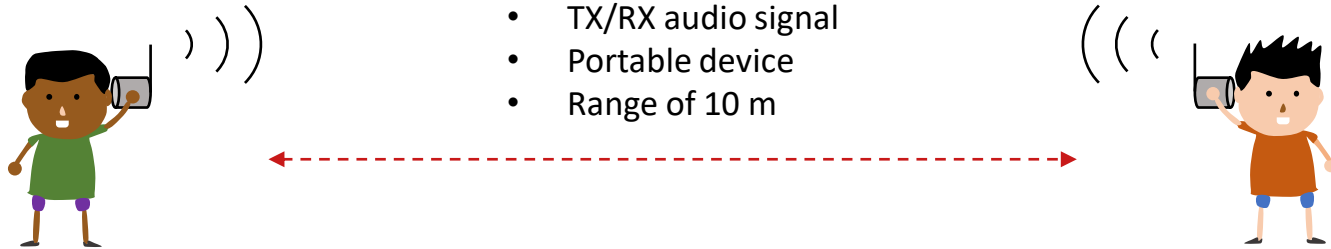
# Objectives

Projects assignments → Flipped-class → Project Videos

1. Design project to be more dynamic;
2. Help student identifying mistakes and improve designs;
3. Good practices of radio frequency circuits;
4. Develop critical thinking and structural understanding of RF circuits;

# Target Application

## Wireless Tin Can Telephone



# Wireless Tin Can Telephone

Design and implement a wireless audio system using discrete components on a breadboard, in such a way that it resembles integrated circuit design as closely as possible.

## Learning Objectives

---

Derive system link budget

---

Understand the system trade-offs

---

Choose appropriate system architecture

---

Choose appropriate RF blocks

---

Understand RF blocks trade-offs

---

Design and test RF blocks

## Experiments

---

Wireless Systems

---

Amplifiers

---

Frequency Mixer (Up and Down)

---

Voltage-Controlled Oscillator

---

Phase-Locked Loop

---

Filters (RF and BB)

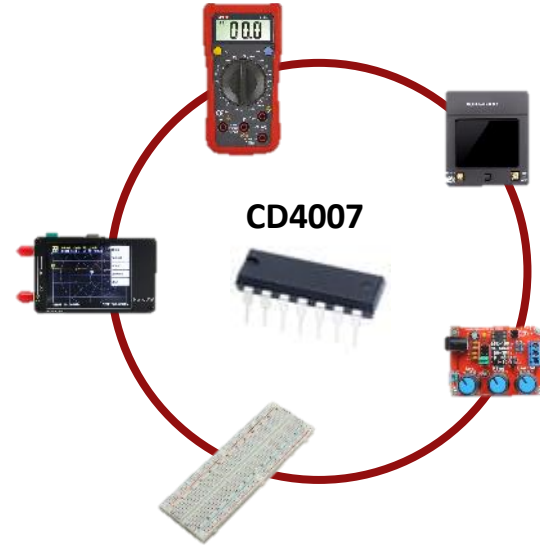
---

Antenna Interface

# Wireless Tin Can Telephone – Software and Equipment



A introductory video is available in our page at Coursera.

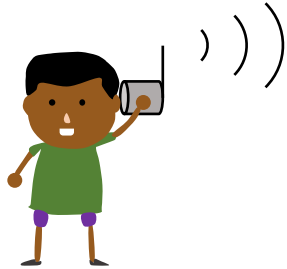


A complete list of required equipment is provided in our page at Coursera.

# Attention

Around the word, great part of the [medium frequency band](#), which will be used in this project, is used for AM broadcasting and transmission at any power is **frowned upon**. Thus, we suggest students designing their projects and contain the signal in a cable. Attenuators can be used to mimic free-space path loss.

# Thanks for watching!



[C.A.M.Costa.Junior@tue.nl](mailto:C.A.M.Costa.Junior@tue.nl)

[P.G.M.Baltus@tue.nl](mailto:P.G.M.Baltus@tue.nl)

